Sandrah P Mack/R1/USDAFS
11/01/2007 03:17 PM

To Shirley Ehmann/R1/USDAFS@FSNOTES
cc Robert K Brassfield/R1/USDAFS@FSNOTES
bcc
Subject Fw: Travel Planning: Preliminary comment from USFWS

Hey Shirley, could you please put the Rob's email, and the attachment in the comments to our travel scoping document. THANKS.
****
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----- Forwarded by Sandrah P Mack/R1/USDAFS on 11/01/2007 03:15 PM -----

Robert K Brassfield/R1/USDAFS
11/01/2007 03:01 PM

To Sandrah P Mack/R1/USDAFS@FSNOTES, Dan Ritter/R1/USDAFS@FSNOTES
cc
Subject Travel Planning: Preliminary comment from USFWS

The USFWS, Helena, did receive a CD of the Travel Management Planning Proposed Action scoping document. It was sent to Anne Vandehey, which was fine.

Preliminary comments from Dan Brewer, USFWS, were that the forest needs to consider prior commitments including the existing Land and Resource Management Plan Biological opinion and INFISH. In particular, RF2c & RF3, and term and Commitment #5 (I can supply the detailed verbiage). Prior commitments with other agencies also need consideration. I mentioned to Brewer that the focus is on recreational use of roads and in the development of the proposal we considered, and will continue to consider,the effects of roads on fish and watersheds. His stance is that when we say we used "Changes suggested by Forest managers based on resource considerations...", we need to incorporate information and analysis like those in the *Land Management Recommendations Related to The Value of Low Road Density Areas...* (attached), and should address the effects that unmaintained roads, and risks they present to bull trout and bull trout recovery when making such decisions. We should have been using factors like road density in watersheds, and having some feel for how or when we're going to meet our road density objectives with this process.

They would like to be kept informed of any scheduled public meetings. Brewer's direct phone number is 329-3951.

LRMP BO commitment.pdf

Rob Brassfield
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==========

Land Management Recommendations Related to The Value of Low Road Density Areas In the Conservation of Listed Salmon, Steelhead, and Bull Trout

A Commitment made as part of the Biological Opinions
For Chinook Salmon and Steelhead
(Snake River and upper Columbia River)
and Bull Trout
(Columbia and Klamath Rivers-areas not covered by the Northwest Forest Plan)

Final Report
January 30, 2002

Prepared by the:
Road Density Analysis Task Team

Presented to the:
Interagency Implementation Team

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Executive Summary

The Biological Opinions for the Land and Resource Management Plans for Forest Service and Bureau of Land Management units in the Snake and Upper Columbia River Basins, for chinook salmon, steelhead, and bull trout, include a commitment to analyze unroaded and low road density areas and determine their importance for long-term conservation of listed fish species. The objectives of the analysis are to: identify and map unroaded and low road density areas, describe their relative value for the listed fish species, summarize the existing management direction for these areas, and develop recommendations regarding future management options.

To fulfill the commitments in the LRMP Biological Opinions, areas of unroaded and low road density were identified and evaluated. The assessment of low road density areas is appropriately completed at two scales; a coarse scale analysis across the Snake and Upper Columbia River basins, and a mid/fine scale analysis to be completed by local units. The information available across the analysis area is sufficient to determine the broad pattern of low road density area extent and value. However, to complete an analysis of specific low road density areas, higher resolution information, only available at the local unit, will need to be incorporated. This report documents the results of the coarse scale analysis, and recommends the broad scale information that could be provided to local units for their use at the mid/fine scale.

The coarse scale analysis was completed at the subbasin scale (4^{th} code HUC), and focused on undesignated low road density areas, defined as those areas without National level management designations. Electronic road layers built by local FS and BLM units, and compiled by the IIT road data team, were used to define these areas. Unroaded areas were defined from the roads layer where the polygon area within a 5^{th} code HUC watershed was greater than 1000 acres. Given the provisional status of these road layers, all of these identified areas were considered low road density areas. These areas were attributed with available, broad scale information. This included biological information on the species, land management status, and broad subbasin ratings of integrity and restoration priority.

To establish species value, information on historic range, current occupied range, priority watersheds, and strong populations were attributed to individual undesignated low road density areas using ICBEMP science assessment data on these parameters. These parameters were weighted, to account for the relative importance of each. The range in species values were classified into five classes and narratively described using a very low to very high ranking.

The coarse scale analysis describes the relative value of the undesignated low road density areas within each subbasin for spring/summer chinook, steelhead, and bull trout. For spring/summer Chinook, the strongest concentration of high value subbasins occurs in Central Idaho. For steelhead, the higher value areas are concentrated in Central Idaho and Central Oregon as expected. The results are significantly different for bull trout with the

concentration of high value areas occurring in Western Montana and Central Idaho, due to the differences in distribution of bull trout compared to the anadromous fish.

The individual species values for chinook, steelhead, and bull trout were combined into an integrated rating of value for these aquatic species. For the integrated rating of the three species, the highest value subbasins are concentrated in Western Montana, Central Idaho, and Central Oregon. This information will be useful in the development of broad conservation priorities for these species, and providing a broad scale context for assessments and analyses at finer scales.

Table 1 summarizes the analysis approach with respect to the commitments in the LRMP Biological Opinions. It is important to note that only a portion of the LRMP Biological Opinion Commitments was accomplished at the coarse scale. Mechanism 3(c) of the Steelhead Biological Opinion requires recommendations to senior level managers on future management of low road density areas in relation to recovery and conservation of anadromous fish with reference to the five following specific items:

1) Need for additional habitat protection.
2) Relative risk (near and long-term) of developmental activities.
3) Priorities for subbasin assessments or watershed analyses.
4) Connectivity between these areas.
5) Restoration priorities.

To determine the current and proposed habitat protection for high value low road density areas, and the need for recommendations for additional habitat protection, the results of the coarse scale analysis should be refined by the field units through Subbasin Assessment and Watershed Analysis for both land management plan adjustments and the development of aquatic conservation and restoration strategies.

Mechanism 3(c) further states that: "Proposed projects requiring road construction in any of these unroaded or low density roaded areas, will be considered to have insufficient analysis for the completion of section 7 consultation and will not be forwarded to level 1 teams until this assessment has been completed". Consequently, proposed road projects are considered as having insufficient analysis until the mid/fine scale analyses are completed.

The mid/fine scale analysis of low road density areas is not expected to be a new job for local units. The expectation is that local units will incorporate the mid/fine scale analysis of individual low road density areas into their ongoing and future assessment and planning efforts.

The recommendations of the Road Density Analysis Team to the IIT address completion and distribution of this analysis, implementation of the mid/fine scale analysis, and broad scale recommendations regarding conservation strategies. The team recommends:

Assess the need for an update of this analysis when there are significant updates in broad scale information, in particular the completion of the identification of priority watersheds for chinook and steelhead.

After IIT acceptance of this analysis, a condensed version of this report should be prepared and distributed to the field units in the analysis area.

The Regional Executives provide direction to the field units that allow for road construction in undesignated low road density areas only after completion of the mid/fine scale analysis of these areas.

The IIT commission the subbasin assessment team to outline and provide guidance, information, and tools to the field units in the analysis area for completion of the mid/fine scale analysis of individual low road density areas. The opportunity to combine this task with other IIT tasks should be evaluated. Members of the RDAT could be added to the subbasin assessment team to ensure a smooth transition and understanding of this analysis and results.

The field units refine this information on high value low road density areas through Subbasin Assessment and Watershed Analysis and apply it to both LRMP adjustments and the development of aquatic conservation and restoration strategies.

Background

LRMP Biological Opinion Commitments

The Land & Resource Management Plan (LRMP) Biological Opinions for chinook salmon, steelhead, and bull trout contain commitments to complete an assessment of unroaded and low road density areas within the Upper Columbia and Snake River basins (Appendix C). These commitments include: the identification and mapping of these areas; a description of the relative habitat value; a summary of the existing management direction for each of these areas; and recommendations related to future management options.

The objective of this assessment is to conduct a comprehensive review of existing unroaded and low road density areas throughout the Snake and Upper Columbia River Basins, determine their importance for the long-term conservation of listed salmonids, identify risks from management activities, and develop recommendations for additional habitat protection beyond existing LRMP's if necessary. This assessment will assist managers in determining future management options for these areas.

Description of Roadless Area Values

Research findings show that some of the highest quality habitat for listed salmonids occurs in unroaded and low road density areas. The assessment of aquatic species and habitats conducted by ICBEMP identified subwatersheds with strong populations of at least one of seven key salmonids and found that sixty eight percent of known and predicted fish population strongholds in the Upper Columbia Basin EIS area are in unroaded condition, of which 37 percent are outside wilderness (Quigley et al. 1997). Unroaded and low road density areas potentially represent areas in which the aquatic ecosystems are still operating with minimal human disturbances. Areas like these that provide for high quality habitat and stable fish populations are important refugia and a cornerstone of most species conservation strategies.

Description of Known Road Effects

The assessment of aquatic species and habitats conducted by ICBEMP summarizes the influence of roads on aquatic ecosystems. Known road effects highlighted in the ICBEMP summary are as follows (Quigley et al. 1997):

1) Roads contribute more sediment to streams than any other land management activity.
2) Serious degradation of fish habitat can result from poorly planned, designed, located, constructed, or maintained roads.
3) Roads can affect water quality through applied road chemicals and toxic spills.
4) Roads directly affect natural sediment and hydrologic regimes by altering streamflow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water

quality, and riparian conditions within a watershed. These habitat alterations can adversely affect all life-stages of fish, including migration, spawning, incubation, emergence, and rearing.

5) Poor road location, concentration of surface and sub-surface water by cross slope roads, inadequate road maintenance, undersized culverts, and sidecast materials can all lead to road-related mass movements.
6) In granitic landtypes, sedimentation is directly proportional to the amount of road mileage.
7) Roads greatly increase the frequency of landslides, debris flows, and other mass movements.
8) Road/stream crossings can be a major source of sediment to streams resulting from channel fill around culverts and subsequent road crossing failures.

Filipek (1993) and Dissmeyer (1994) suggested that sedimentation has the highest potential to negatively impact aquatic systems and their communities. It is well documented the Forest Road system is the largest source of sediment movement into streams (Cederholm and Reid 1987, Seehorn 1987, Furniss et al. 1991). Roads change the natural drainage network by increasing the amount of functioning channels, which can result in an increase in erosional processes (Filipek 1993). Even well engineered roads act as conduits for sediment (Filipek 1993). Lee et al. (1997), also note that although improvements in road construction and logging methods can reduce sediment delivery to streams, sedimentation increases are unavoidable even when using the most cautious logging and construction methods. In the Clearwater River in the State of Washington, Cederholm et al. (1981) related increases in fine sediment to the amount of roading and concluded that when the area of roads exceeded 3 % of the basin area, the intragravel fine sediment would likely exceed levels found in undisturbed watersheds.

Many authors have investigated fine sediment effects on salmonids. Research has demonstrated that when fine sediment (< 6.5 mm) levels in salmonid spawning gravels reach 30 %, trout fry emergence is reduced to 40 % (Everest and Harr 1982, USDA Forest Service 1977). Cederholm and Reid (1987) reported decreases in salmonid fry survival up to 3.4 % for each 1 % increase in fine sediment levels.

As stated in the Biological Opinion for bull trout (USFWS 1998), there is no positive contribution from roads to physical or biological characteristics of watersheds. Under present conditions, roads represent one of the most pervasive impacts of management activity to native aquatic communities and listed fish species. Although Lee et al. (1997), note that the threshold for negative response from road induced sedimentation and hydrologic modification to streams is not well understood, their analysis does identify overall patterns related to road densities. The correlation between bull trout status classification and geometric mean road density was significant (p=0.0001) and negative for the arithmetic mean of upstream road density with bull trout being absent at a mean road density of 1.71 mi./sq.mi., depressed at 1.36 mi./sq.mi., and strong at 0.45 mi./sq.mi. (Quigley et al. 1997).

Interagency Implementation Team

To provide guidance and oversight, and represent the senior executives, in the implementation of the LRMP Biological Opinions (BO's) for chinook salmon, steelhead, and bull trout an Interagency Implementation Team (IIT) has been established. This team coordinates the implementation of BO commitments, either by the local field units or through centralized efforts across the Snake and Upper Columbia River basins. The IIT has commissioned task teams to complete these centralized tasks where they can be accomplished more efficiently, or when the work requires a basin-wide approach. The IIT has commissioned several task teams to assist in the implementation of the BO's, including a Road Data Team, Monitoring Team, Restoration Team, and Subbasin Assessment Team

Road Density Analysis Team

The Road Density Analysis Team (RDAT) was chartered by the IIT to complete the commitments in the LRMP BO's described above. The membership of the RDAT included representatives from the four agencies (Forest Service, Bureau of Land Management, National Marine Fisheries Service, and Fish & Wildlife Service), from a variety of disciplines and levels in the organizations (Appendix B).

Relationship to Other Efforts & Teams

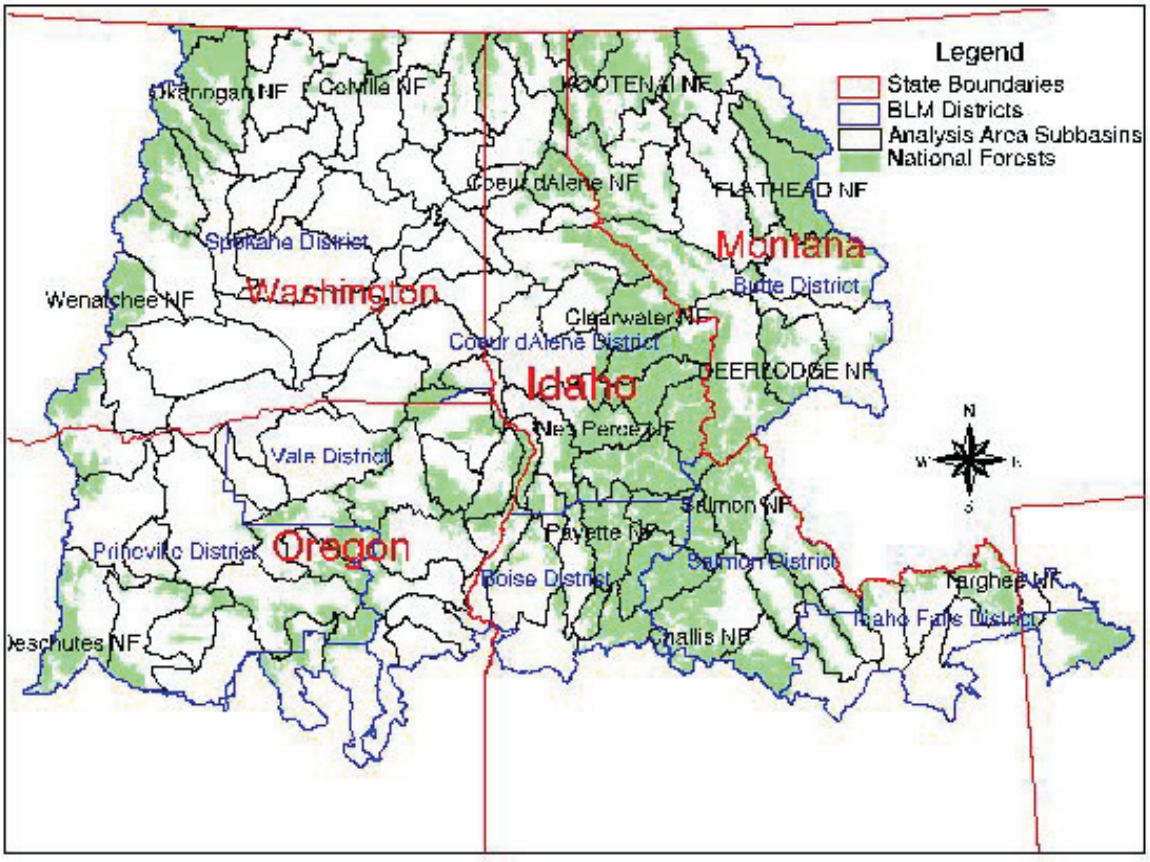
This analysis is a focused effort intended to fulfill the commitments in the LRMP Biological Opinions for listed fish species in the Snake and Upper Columbia River basins. The team was chartered to complete a specific task for the IIT, including both the development of information and recommendations. Most of the information compiled by the RDAT was from existing sources, principally the Interior Columbia Basin Ecosystem Management Project (ICBEMP). Without the extensive effort by this project to develop information across the analysis area, this analysis would not have been possible within the established timeframes.

The RDAT team recognized the overlap with several other efforts and teams including National efforts by the Forest Service on Roadless Area Conservation and the rule making for the new road management policy with its requirement for roads analysis process. The RDAT analysis is intended to avoid any duplication of the effort of these groups, while contributing to the approach these teams have established. The results of the RDAT analysis should provide one component of the broad-scale context suggested for roads analysis, which will be required by the new road management policy. Additionally, the RDAT analysis focuses on the potential areas termed as "unroaded" areas by the Roadless Area Conservation IDT, providing information about these areas that should assist field units in the local analysis of these areas.

Analysis Area

The analysis area encompasses the PACFISH and INFISH areas within the states of Washington, Oregon, Montana, and Idaho. It does not include the portions of Washington and Oregon covered under the Northwest Forest Plan, the portion of the Columbia River Basin in Wyoming since it isn't covered by INFISH, or the portions of the Columbia River Basin in California and Nevada (Figure 1).

Figure 1 – Analysis Area Location Map



Conceptual Approach

The LRMP BO commitments related to the analysis of unroaded and low road density areas define a large, difficult job. In order to accomplish this commitment, the RDAT spent considerable time defining an approach to the analysis that would fulfill the commitments, while producing accurate, and useable results. The job required the team to reach consensus on conservation biology concepts, technical electronic processes, and linkages between the scales and sequence of assessments and analyses. The team has designed an approach to this analysis that meets the intent of the LRMP BO, while recognizing the limits in the resolution of broad scale information.

The areas identified and described in this analysis are referred to as low road density areas. This is based on the provisional status of the electronic road layers used to complete this analysis, and to avoid confusion with terms and definitions used in other related analyses.

The most challenging aspect of the BO commitments is related to the broad extent of the analysis, combined with the small size of the defined areas, and the high resolution of information needed to develop meaningful recommendations. While there is the need to understand the value of low road density areas in the broad sense across the basins, the resolution and wide range of information needed to develop site specific recommendations (that represent an integrated understanding of the conditions, values, and sensitivities of these areas) is not available or effectively assembled across this broad scale. Additionally, it is not possible, or appropriate, that this team attempt to duplicate the local efforts by the field units and Level 1 teams. Consequently, the team used an approach to this analysis that attempted to address the broad scale questions and needs in a coarse scale analysis, while reserving the higher resolution, finer scale questions for the local units to complete in a mid/fine scale analysis.

Table 1 summarizes the analysis approach with respect to the commitments in the LRMP Biological Opinions (Appendix C). It is important to note that only a portion of the LRMP Biological Opinion Commitments was accomplished at the coarse scale. Mechanism 3(c) of the Steelhead Biological Opinion requires recommendations to senior level managers on future management of low road density areas in relation to recovery and conservation of anadromous fish with reference to the five following specific items:

1) Need for additional habitat protection.
2) Relative risk (near and long-term) of developmental activities.
3) Priorities for subbasin assessments or watershed analyses.
4) Connectivity between these areas.
5) Restoration priorities.

To determine the current and proposed habitat protection for high value low road density areas, and the need for recommendations for additional habitat protection, the results of the coarse scale analysis should be refined by the field units through Subbasin Assessment and Watershed Analysis for both land management plan adjustments and the development of aquatic conservation and restoration strategies.

Mechanism 3(c) further states that: “Proposed projects requiring road construction in any of these unroaded or low density roaded areas, will be considered to have insufficient analysis for the completion of section 7 consultation and will not be forwarded to level 1 teams until this assessment has been completed”. Consequently, proposed road projects are considered as having insufficient analysis until the mid/fine scale analyses are completed.

It is not expected that the mid/fine scale analysis to be completed by the field units will constitute a new job. The expectation is that the information on low road density areas

developed by the RDAT will be supplemented with local information and incorporated into the local unit's ongoing and future assessments and analyses.

The team defined three broad-scale analysis needs:

> Development of the broad scale pattern and context of low road density areas across the basins, with respect to their occurrence, value for the listed fish species, and broad scale management designation.
>
> Efficient and consistent identification of low road density areas, with a centralized effort, and the development of information and analysis tools for the field units in the basins, for use in finer scale analyses.
>
> Development of broad scale recommendations regarding future management options, focused on broad scale strategies and decisions.

The development of the broad scale pattern and context of low road density areas across the basins was accomplished through an analysis at the subbasin (4^{th} Code HUC) scale. The results of this analysis is presented in the Analysis and Results section. The extent and attributes of individual areas were summarized for each subbasin. The coarse scale analysis was based on subbasin characteristics and the results of this analysis are subbasin scale products. It is expected that the individual low road density areas will be assessed in the mid/fine scale analysis by the local field units.

The centralized construction of information and tools regarding low road density areas is mostly complete. The individual low road density areas across the basins have been identified. Broadly available information has been attributed to these areas. The remaining work is to package this information for use by the local units.

The results and recommendations from this analysis are presented in their respective sections in this document. The coarse analysis should be of assistance in the development or review of other broad scale conservation strategies for these species.

Table 1 – Summary of Analysis Approach

LRMP BO Commitment	Coarse Scale Accomplishment	Mid/Fine Scale Expectations
Identification & mapping of low road density areas	Completed	Information provided to field units & incorporated into ongoing and future assessments and analyses
Description of relative habitat value for listed fish species	Completed at broad scale (subbasins)	To be completed for individual areas, following supplementation with local information
Summary of existing management direction	Completed for broad scale management designations (National level)	Local management designations to be incorporated
Recommendations on the need for additional habitat protection	Completed at broad scale (subbasins)	To be developed locally with the understanding of the broad context from this analysis
Recommendations on the relative risk of developmental activities	Consideration of specific activities not appropriate at coarse scale	To be developed locally with the understanding of the broad context from this analysis
Recommendations on the priorities for subbasin assessments or watershed analyses	No specific recommendations developed by team. Analysis may be a useful component in this prioritization at both the coarse and mid/fine scales	Analysis may be useful component in locally developed priorities
Recommendations regarding connectivity between areas	Connectivity between undesignated and other low road density areas characterized in subbasin classification	To be developed locally with the understanding of the broad context from this analysis and subbasin classification
Recommendations regarding restoration priorities	No specific recommendations developed by team. Analysis may be useful component in prioritization, particularly in reconnecting and rebuilding out from high quality areas.	Analysis may be useful component in locally developed priorities

Analysis

This section describes the procedures used in the analysis of low road density areas.

Identification of Low Road Density Areas

The Road Density Analysis Team (RDAT) used existing data to map and describe the unroaded and low road density areas. The starting point was the electronic road layers from the individual units that had been compiled by the IIT Roads Data team. These road layers represent the best available data on the existing roads for each of these units. It is possible that the resolution of these products vary between units, depending on the source and

augmentation of these layers by the local units. The RDAT did not complete any analysis of these road layers before using them.

The electronic road layers were used to define unroaded and low road density areas on Forest Service and Bureau of Land Management administered public lands within the analysis area (Figure 1). Areas were defined from the roads layer where the polygon area within a 5th code HUC watershed was greater than 1000 acres (Appendix D). Additionally, the protocol created unroaded polygons that were consolidated, by avoiding polygon necking between closely adjacent roads. The protocol achieves this result by buffering the existing roads to create the unroaded polygons, and then expanding these polygons back out to within 50' of the existing roads. Based on the size of the buffer used, this procedure results in polygons with a varying degree of consolidation. Following the evaluation of trial runs, the team agreed on the use of a ¼ mi buffer to achieve the desired degree of consolidation. As mentioned, the unroaded polygons are expanded back out to within 50' of the existing roads to create the final unroaded polygons used in this analysis.

The original intent of the LRMP BO's was to include areas of low road density in the unroaded area analysis. The analysis of these areas showed that these polygons are always a subset of the unroaded polygons defined above, except for the areas immediately adjacent to existing roads. Including these areas in this analysis would result in a product of inconsistent attributes. Consequently, the road density analysis team recommended and implemented this analysis using only the polygons defined by the Appendix D protocol.

Because the electronic road layers used in this analysis may not include all existing roads, particularly when local units have not had the opportunity to augment the base road layers with local knowledge, it should not be assumed that the polygon areas defined by the protocol are unroaded. Roads are likely to exist in these areas that have not been included in the electronic road layers used in this analysis. Consequently, this analysis will refer to the polygon area defined using the Appendix D protocol as low road density areas.

The low road density areas identified above were attributed with relevant, available information to complete the assessment. This included biological information on the species, land management status, and broad subbasin ratings of integrity and restoration priority. This information was used to complete this analysis or is expected to be important information provided to local units for completion of the mid/fine scale analysis. To complete the coarse scale analysis, the attribute information about the low road density areas was summarized for the subbasin.

The low road density areas were grouped into three classes based on the level of management designation for the area. This grouping was completed to understand at what level the management designation for the area was defined. The area outside the low road density areas was included as a fourth category to complete the description of road density classes. Table 2 defines these road density classes.

Table 2 – Description of Road Density Classes

Road Density Class	Definition	Management Level
Wilderness	Area of low road density designed as Wilderness.	National level management designation.
Rare II and Wilderness Study	Area of low road density identified as a Rare II area or a Wilderness Study area (W/S).	National level management designation.
Undesignated Low Road Density Area	Area of low road density not included in the above two categories.	Unit level management designation
Roaded Area	Areas not a part of the low road density area.	Unit level management designation

Characterization of Undesignated Low Road Density Areas

Undesignated low road density areas occur in a variety of circumstances, considering both extent and association with other road density classes. The conservation role these areas may play changes based on these circumstances, independent of the relative value of these areas for the species considered. When undesignated low road density areas are associated with large Wilderness areas, they may play an additive function, expanding the extent of core areas of quality habitat or populations. These areas are likely to act as source areas for rebuilding populations into adjacent subbasins. When undesignated low road density areas are isolated in a subbasin, they may play a role as a refuge of habitat and/or fringe population. These areas play a different role in species conservation, representing unique genetic or phenotypic variation and/or acting as a source area for rebuilding within the subbasin. The resilience of these populations may be considerably less than those associated with other large low road density areas. To describe this conservation role, the following categories of undesignated low road density areas were developed.

Table 3 – Characterization of Undesignated Low Road Density Areas

Category	Amount of Undesignated Low Road Density Area (Acres)	Percent of Total Low Road Density Areas that are Undesignated	Description
Large Mixed Blocks	>250,000	33% - 66%	Very large amounts of undesignated low road density area are equally balanced with large amounts of other low road density areas.
Associated	50 – 250,000	0 – 33%	Undesignated low road density areas are associated with larger

			amounts of other low road density areas.
Intermixed	50 – 250,000	33% - 66%	Undesignated low road density areas are equally balanced with other low road density areas.
Isolated	50 – 250,000	66% - 100%	Undesignated low road density areas constitute the majority of the low road density areas in the subbasin.
Small, Associated	<50,000	0 – 33%	The small amount of undesignated low road density areas is associated with larger amounts of other low road density areas.
Small, Intermixed	<50,000	33% - 66%	The small amount of undesignated low road density areas is mixed with other low road density areas.
Small, Isolated	<50,000	66% - 100%	The small amount of undesignated low road density areas constitute the majority of the low road density area in the subbasin.
Negligible	<1000	0 –100%	The amount of undesignated low road density area in this subbasin is negligible at the coarse scale.

This characterization of undesignated low road density areas was applied to the subbasins in this analysis to assist in the understanding of the context of the low road density areas in a subbasin.

Species Value of Undesignated Low Road Density Areas

The relative value of undesignated low road density areas to chinook, steelhead, and bull trout was assessed to support both the coarse and mid/fine scale analysis of these areas. Understanding the relative value of these areas to these aquatic species is a central component in determining the relative priority of these areas for conservation. For the coarse scale analysis, species value was determined for a subbasin, based on the attributes of individual undesignated low road density areas. This product will provide the broad context for the mid/fine scale analysis. At the mid/fine scale, additional local information should be incorporated into the analysis to describe the relative species value for individual undesignated low road density areas.

To establish species value, information on historic range, current occupied range, and strong populations were attributed to individual undesignated low road density areas. The ICBEMP science assessment data on these parameters was used. Undesignated low road density area in Priority Watersheds[1] was used for bull trout, but not for the other species. The priority

[1] Priority watersheds for bull trout are considered areas identified as core areas or special emphasis watersheds for this species.

watersheds for bull trout have been identified across the analysis area. For chinook and steelhead, there are portions of the analysis area where priority watersheds have not been established, specifically in the Mid-Columbia. Consequently, this information was not be used for these species to avoid results that were biased to the areas where priority watersheds have been identified. The acres of undesignated low road density area within each of these categories was summed by subbasin. These four parameters were then integrated together to develop a single relative value ranking. These parameters were weighted, to account for the relative importance of each. After evaluation of several approaches, the team agreed on the following formula for combining these four parameters:

$$\text{Relative Value} = (\text{Ac Strong Pop} * 1) + (\text{Ac Priority Watershed} * .3)^2 + (\text{Ac Occupied} * .1) + (\text{Ac Historically Occupied} * .02)$$

This formula was used for all three species, except the priority watershed factor, which was used only for bull trout. The values for each subbasin based on this calculation were normalized to a range of 0 to 1 by dividing by the largest value, to ensure that species values were equal. The range in species values were classified into five classes for display using the natural breaks function, which designates the classes to minimize the variance in each class and totally. These classes have been narratively described using a very low to very high ranking.

There are areas currently inaccessible to fish species that are assigned a value based on the area being historically occupied by these species, for example the North Fork of the Clearwater subbasin. The resources available for this analysis did not allow for exclusion of these areas.

A variety of formulas were evaluated as different approaches to determining relative value for a species. Both factors and weighting ratios were varied. Changes in this equation resulted in only minor changes in the results at the subbasin scale. The pattern of relative value across the basins remained relatively constant, although a specific subbasin might change class. It was determined that at the coarse scale, the formula for relative value did not require extensive sensitivity analysis to assure the results were accurate. This relative ranking should be useful in providing a broad context for the specific undesignated low road density areas as they are evaluated in the mid/fine scale analysis.

Integration Species Value of Undesignated Low Road Density Areas

The species specific values established for each subbasin were integrated into a single integrated species value to allow for consideration of a multi-species approach to conservation. The team considered using either an additive approach or a maximum value approach to integrating the individual species values. The additive approach represents a philosophy of maximizing the multiple species benefit, while the maximum value approach represents a philosophy of combining the individual species benefit without increasing the benefit for multiple species. While it is typical to seek multi-species benefits, there is a risk that this approach would favor sympatric species at the expense of allopatric species. The

[2] This factor used for bull trout only.

team felt that the ESA provided protection to a species that could not be discounted based on multi-species benefits elsewhere, and decided to use a maximum value approach to integration. This approach to integration resulted in increased correlation between the integrated value and the relative value for bull trout, as compared to the additive approach

Assumptions and Limitations

The following are assumptions or limitations of the road density analysis:

The electronic road layers used to define areas of low road density were built from a mosaic of existing data that was readily available to the agencies, such as U.S. Geological Survey Digital Line Graph, and U.S. Forest Service Cartographic Feature File data, augmented, in some units, with customized local data. However, these sources are not necessarily up-to-date, or uniform in quality and reliability across the landscape. As such, we cannot assure that our road density information accurately reflects the actual road densities that exist in any one unit, at the time of this analysis. We simply used the agency-supplied data made available to us and made no attempt to independently verify its accuracy.

The broad scale information used in this analysis was the best information available at the time. There may be updated information available in the future that might improve the precision of this analysis. As an example, completion of the priority watershed network for the anadromous species would allow for use of this information in the determination of relative value. The ICBEMP information used on species status (strong populations) is currently being updated for a portion of the analysis area through the Inland West Water Inventory (IWWI) effort. This updated information would improve this analysis. The electronic infrastructure of this analysis allows for quick response to changes. When significant updated information becomes available this analysis should be redone to keep current with our information base.

Results

This section describes the results of the low road density area analysis.

Description of Low Road Density Areas

Figure 2 displays the low road density areas, stratified by road density class, for the analysis area. As can be seen from this figure, the pattern of distribution is distinct by class. The undesignated low road density areas occur at a smaller size, and in a less concentrated pattern, than the other low road density classes. The undesignated low road density areas are often associated with the other low road density classes, but there are also cases where this is not true, particularly in the Northern part of the analysis area.

Figure 2 – Low Road Density Areas

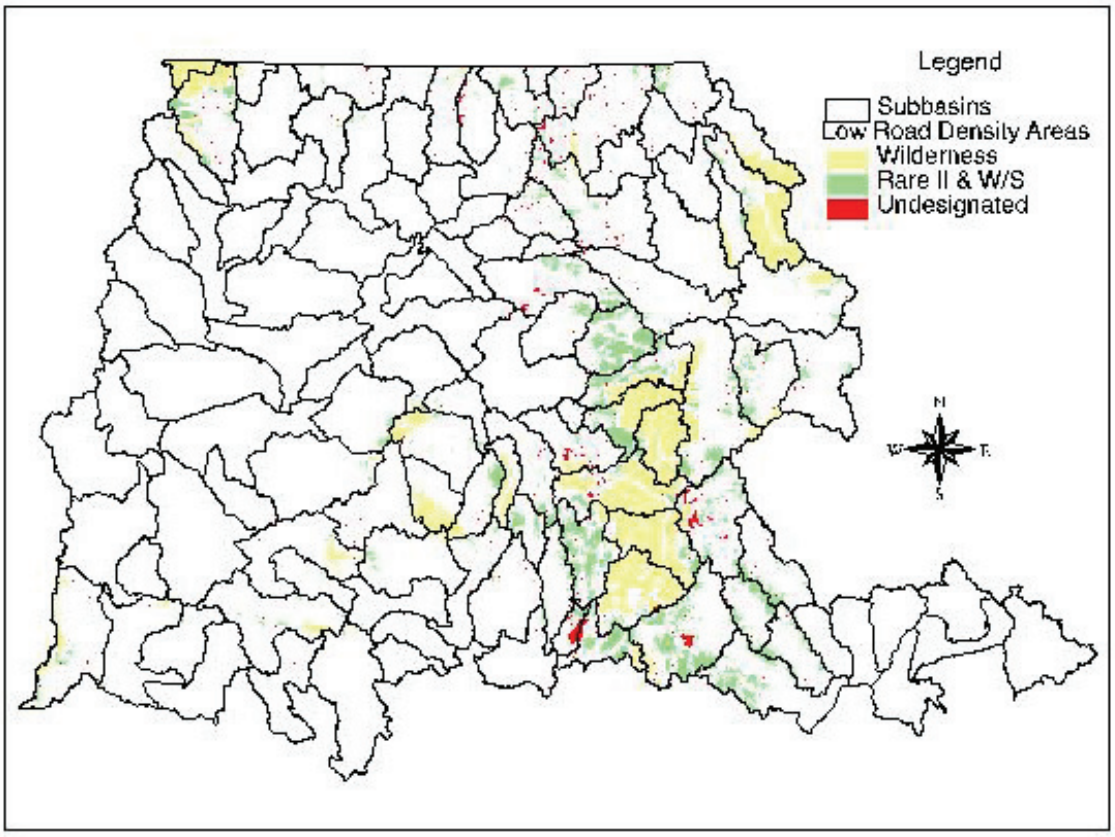


Table 4 provides a general description of the low road density areas in the analysis area, stratified by road density class.

Table 4 – Summary of Low Road Density Areas

Road Density Class	Total Acres	Percent FS & BLM Lands	Percent of Low Road Density Area
Wilderness	6,947,340	18%	33%
Rare II & Wilderness Study	8,154,487	21%	38%
Undesignated Low Road Density Areas	6,166,582	16%	29%
Total	21,268,409	55%	100%

As displayed in Table 4, the low road density area constitutes a large percentage of the Forest Service and Bureau of Land Management lands in the analysis area, fairly evenly spread across the road density classes. However, as can be seen in Figure 2, the occurrence of low road density areas varies by subbasin both in amount and class.

Figure 3 displays an example of the low road density areas at the subbasin scale, using the South Fork Clearwater subbasin. While the acres of low road density area in this subbasin are relatively high, it does display the general pattern of occurrence and patch size of the low road density classes.

Figure 3 – Subbasin Example of Low Road Density Areas

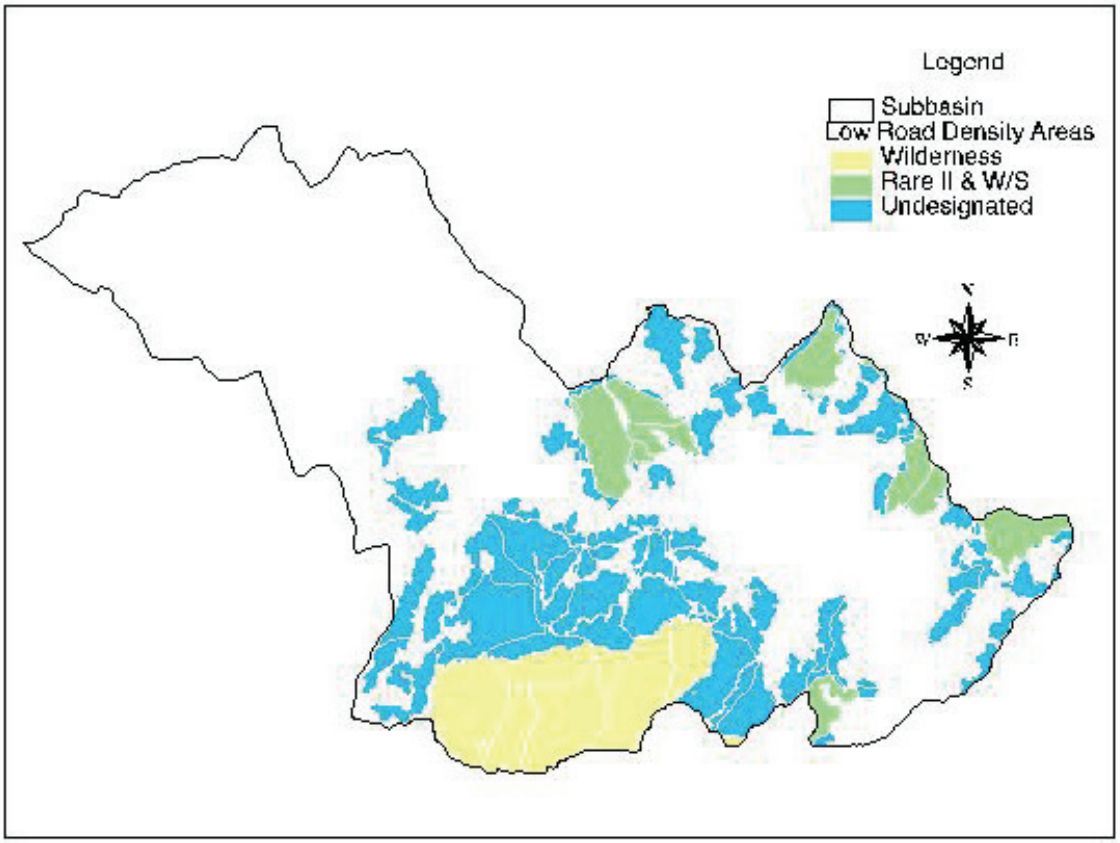


Figure 4 displays the low road density area in Wilderness in each subbasin. As expected, these low road density areas occur in a relatively few subbasins, concentrated in Central Idaho. Figure 5 displays the low road density area in Rare II and Wilderness Study (W/S) areas in each subbasin. These areas are more evenly distributed than Wilderness, with the subbasins with the greatest area concentrated in Western Montana, and Idaho.

Figure 4 – Low Road Density Area in Wilderness Areas

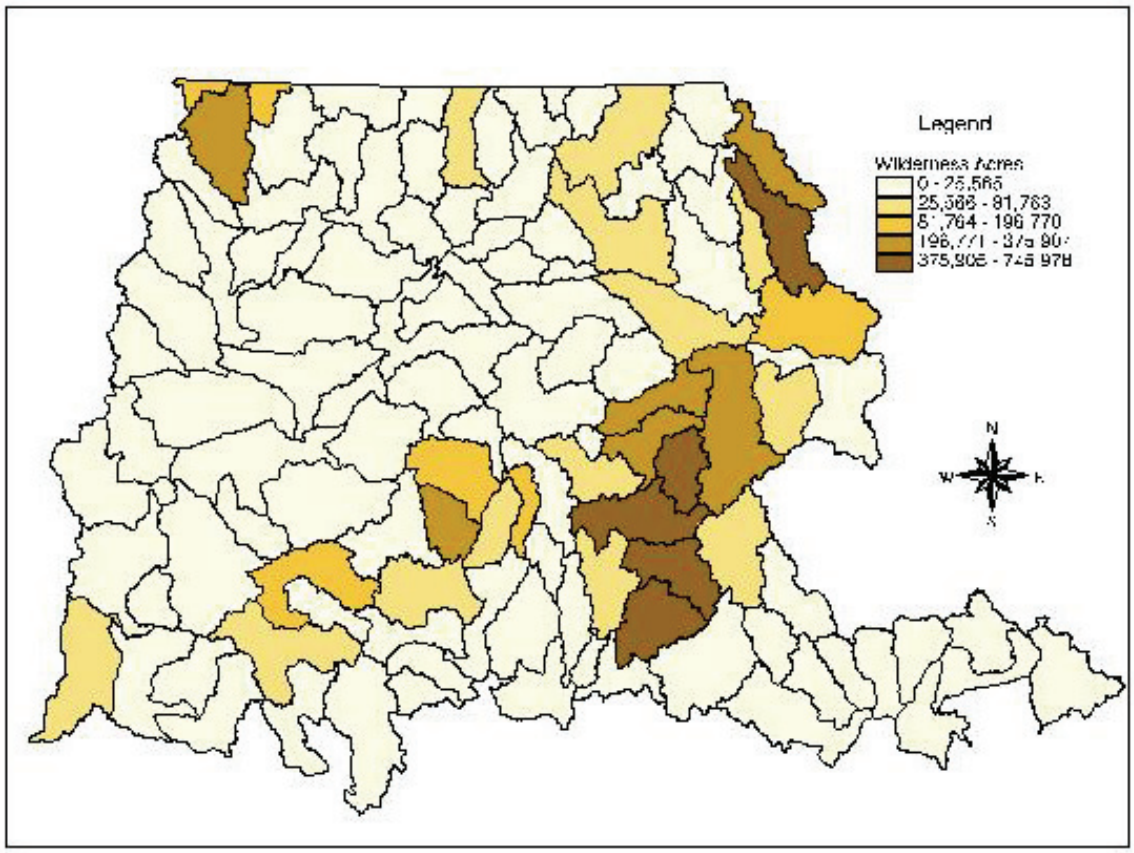


Figure 5 – Low Road Density Area in Rare II and Wilderness Study Areas

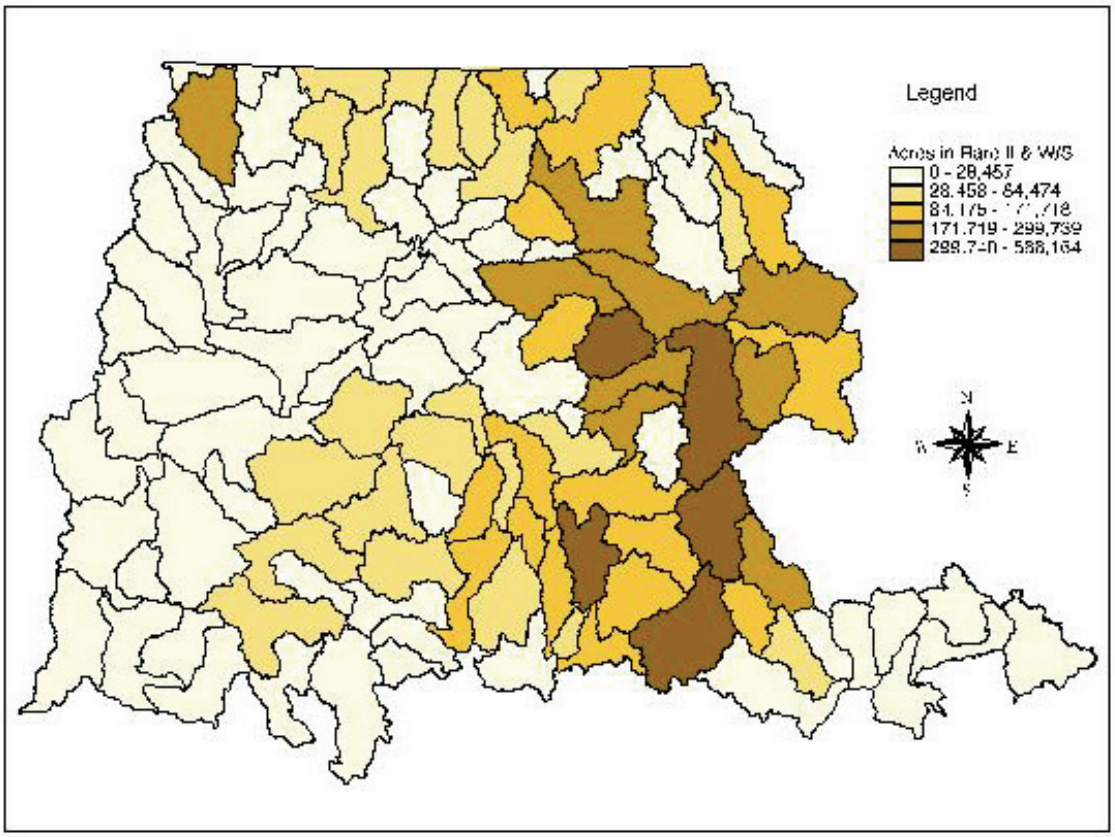


Figure 6 displays the undesignated low road density area within each subbasin. These areas are more evenly distributed than the other road density classes, with concentrations occurring in Western Montana, Idaho, and Northern Washington. Figure 7 displays the percentage of the low road density area in a subbasin that is undesignated. This is an important perspective on the low road density areas, and identifies areas where the majority of the low road density area is in the undesignated class. West-Central Oregon, Northern Washington, Northern Idaho, and Northwestern Montana are places where the undesignated low road density areas are likely to play a greater role, due to the high percentage of the total low road density area that they represent.

Figure 6 – Undesignated Low Road Density Areas

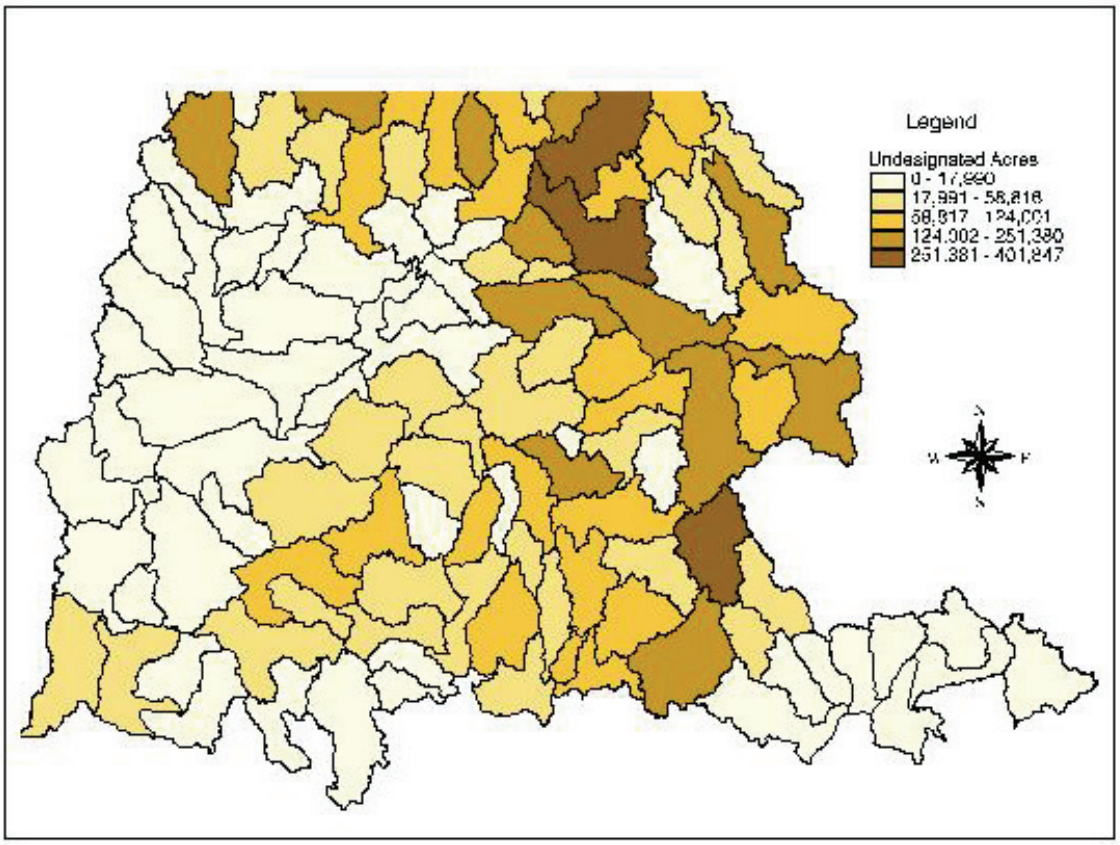
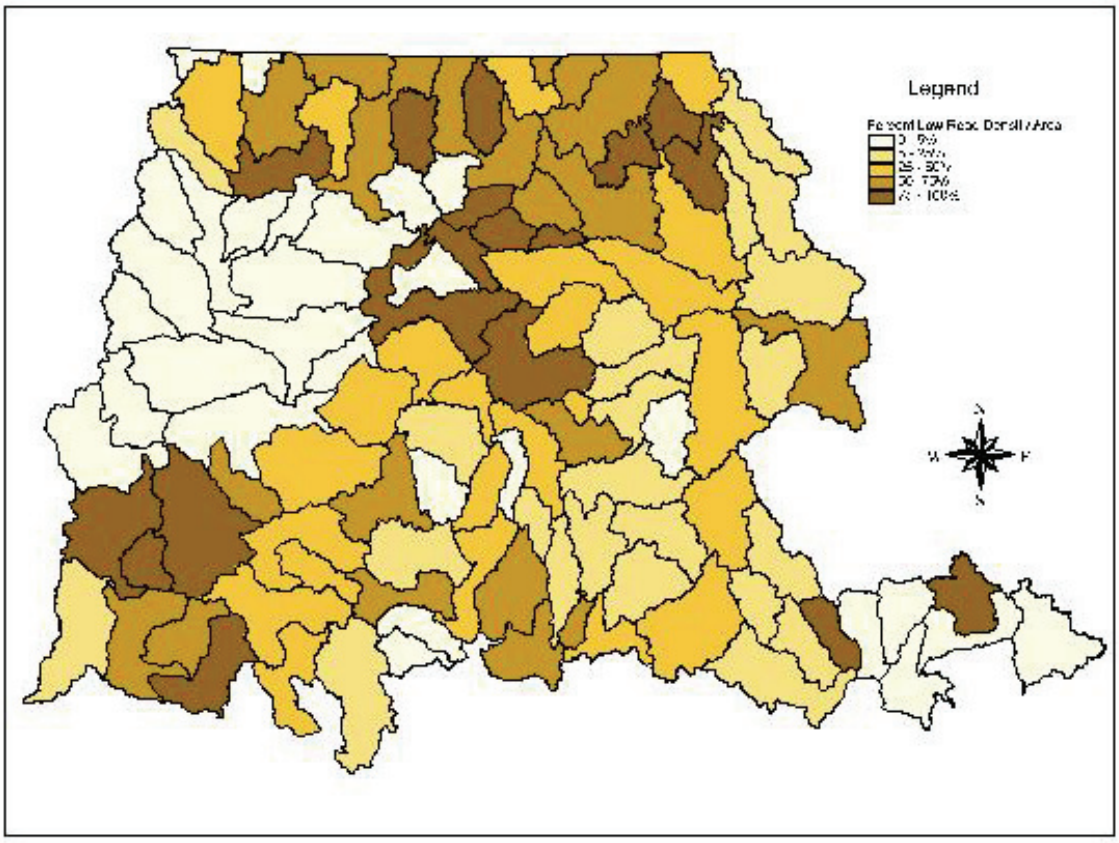


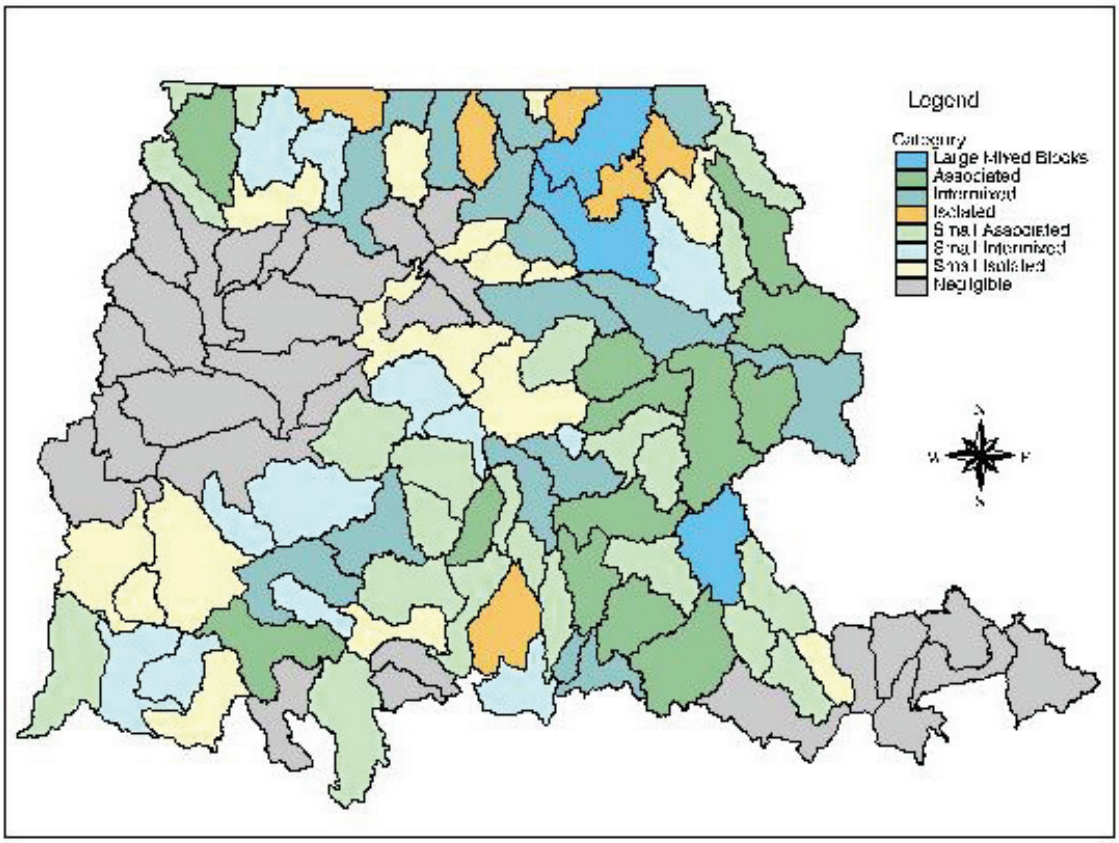
Figure 7 – Percent of Low Road Density Area in Undesignated Areas



Characterization of Undesignated Low Road Density Areas

Figure 8 displays the results of the classification of undesignated low road density areas for the subbasins in the analysis area, described in the previous section. As can be seen in this display, there are many subbasins where the undesignated low road density areas are associated (less than 1/3 of the total) with larger areas of low road density in other classes. These areas are concentrated in Western Montana, Central Idaho, and Eastern Oregon. The subbasins where the undesignated low road density areas are intermixed with other low road density classes are well distributed, Northern Idaho and Northern Washington being areas of concentration. There are relatively few subbasins with significant amounts of isolated undesignated low road density areas (greater than 50,000 acres, greater than 2/3 of the total), most of these occurring in Northern Idaho and Northern Washington. The small isolated areas of undesignated low road density are often found at the transition between upland forests and lower elevation valleys, and may play a unique role in conservation of these listed fish species.

Figure 8 – Classification of Undesignated Low Road Density Areas



The primary use of this classification is to provide a broader understanding of undesignated low road density areas within a subbasin in the mid/fine scale analysis. As undesignated low road density areas are evaluated at this local scale, this context should allow for consideration of the unique role these areas may play in the subbasin that is being considered.

Species Value of Undesignated Low Road Density Areas

Figure 9 displays the relative value of undesignated low road density areas for spring/summer chinook salmon. This value is strongly influenced by the amount of undesignated low road density area that is currently occupied by this species, based on the limited number of strong populations across the analysis area. Figure 9 corresponds with the generally accepted distribution of spring/summer chinook and the importance of subbasins for this species; however, it can be seen how the amount of undesignated low road density area in the subbasin (Figure 6), and the overlap with spring/summer chinook distribution has influenced the result. The strongest concentration of high value subbasins occurs in Central Idaho, as might be expected. Central Oregon does not rate as high as might be expected due to the fewer number of undesignated low road density acres that overlap with current spring/summer chinook distribution.

Figure 9 – Relative Value of Undesignated Low Road Density Areas for Spring/Summer Chinook Salmon

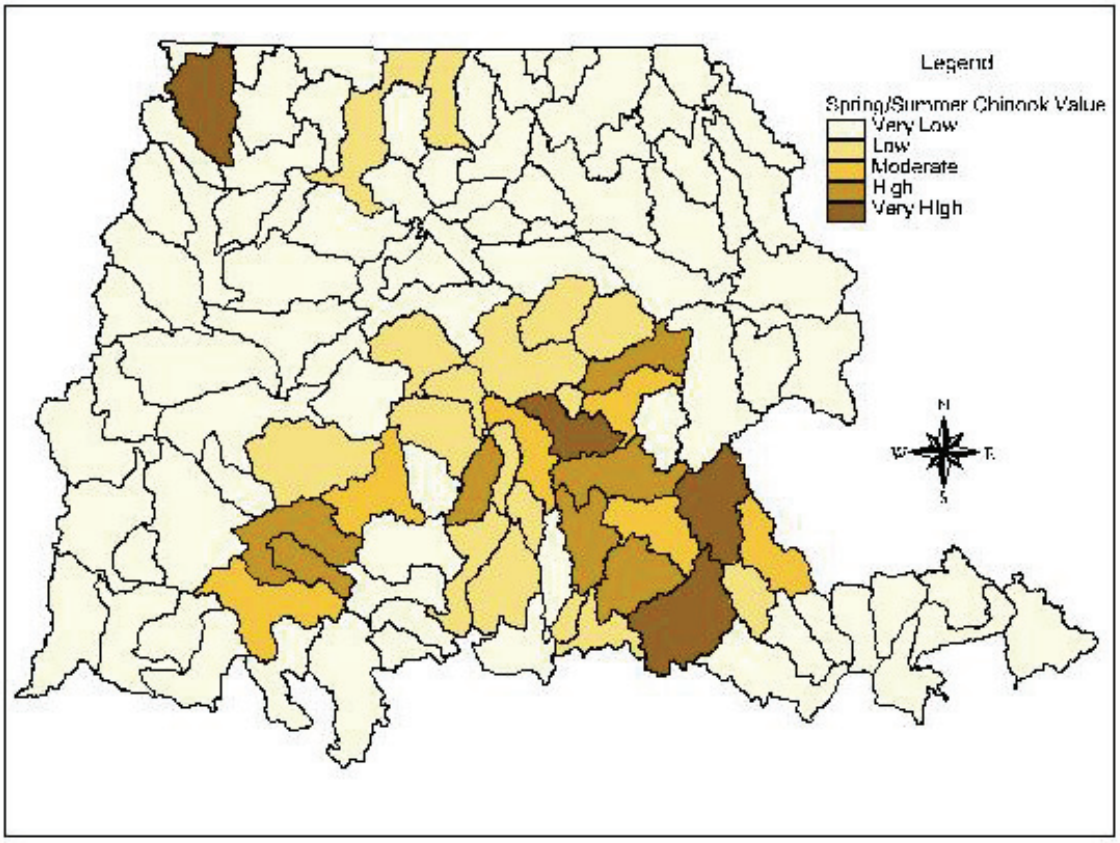


Figure 10 displays the relative value of undesignated low road density areas for steelhead. The higher value areas are concentrated in Central Idaho and Central Oregon as expected. This result is well correlated with acres of strong populations, as well as currently occupied acres.

Figure 10 – Relative Value of Undesignated Low Road Density Areas for Steelhead

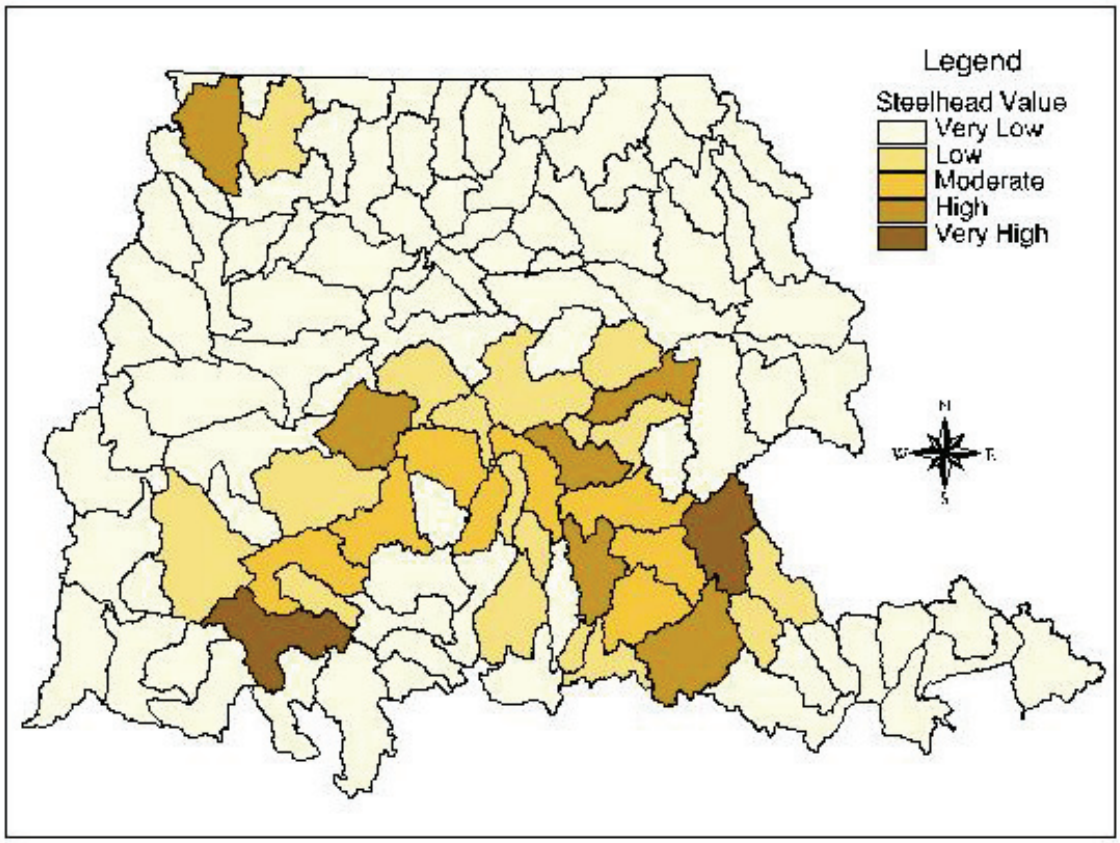
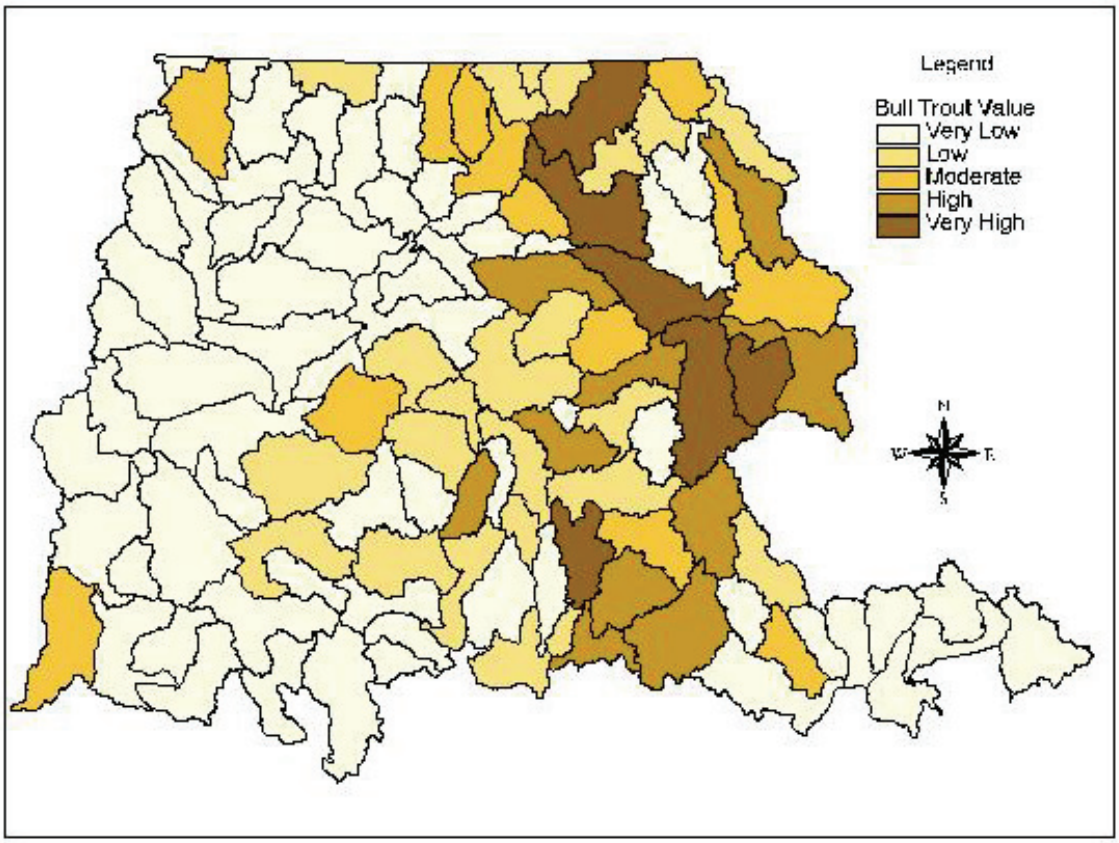


Figure 11 displays the relative value of undesignated low road density areas for bull trout. This result is significantly different than the previous two, with the concentration of high value areas occurring in Western Montana, and Central Idaho, due to the difference in distribution of bull trout compared to the anadromous fish considered. This result is strongly influenced by the acres of undesignated low road density in priority watersheds, along with areas of strong populations.

Figure 11 – Relative Value of Undesignated Low Road Density Areas for Bull Trout



The undesignated low road density areas in the analysis area may play a greater role in bull trout conservation, than the other species considered. While species distribution obviously affects this relationship, the general pattern of road density classes across the basin also has an influence. Bull trout distribution corresponds with the portion of the basin that has a large amount of undesignated low road density area (Figure 6), Western Montana, while the distribution of the other species correspond better with the large amounts of Wilderness (Central Idaho) and portions of the basin with lower percentages of area in low road density (Central Oregon). The low road density areas are expected to play an important role in the conservation and recovery of all listed fish species. However, given the distribution of these species, the distribution of the undesignated low road density areas, and the complexity of factors affecting each species, the undesignated low road density areas appear to be very important for bull trout.

Integration Species Value of Undesignated Low Road Density Areas

Figure 12 displays the integrated species value of undesignated low road density areas across the basin. The highest value subbasins are concentrated in Western Montana, Central Idaho, and Central Oregon. This pattern of this integrated value differs substantially from the simple occurrence of undesignated low road density areas (Figure 6). While the results of all three species evaluations can be seen in this integration, the relative value for bull trout has a strong influence on this product.

Figure 12 – Integrated Species Value of Undesignated Low Road Density Areas

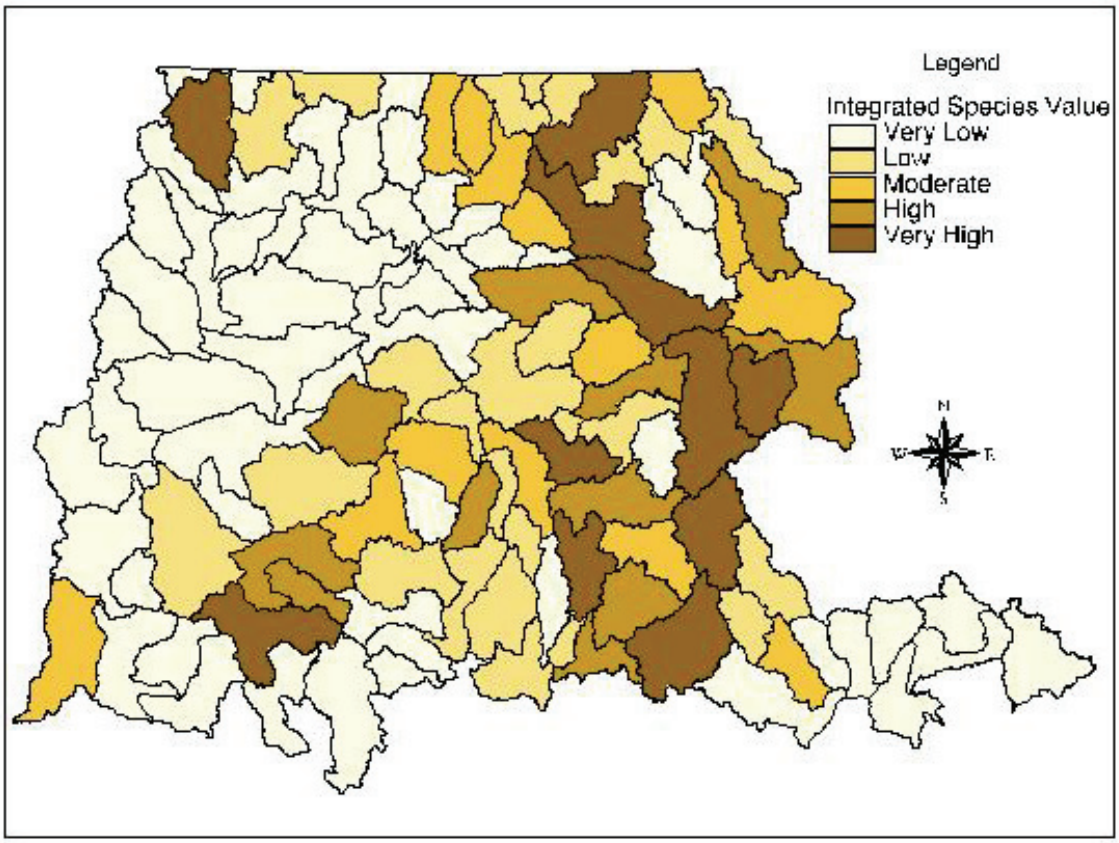


Figure 12 is intended to provide the basin scale context for undesignated low road density areas, in terms of species value, that should be useful in the mid/fine scale analysis of these areas. Additionally, this product will be used at a broad scale to assess conservation strategies across the basin, given the importance of undesignated low road density areas both in terms of habitat quality and future management direction.

Recommendations

Coarse Scale Recommendations

The undesignated low road density areas represent an important habitat component in the conservation strategy for listed aquatic species. These are areas expected to have higher integrity than the developed portions of the basin, and flexibility regarding future management options is higher than in other low road density areas.

To evaluate the need for recommendations regarding additional habitat protection, the current level of habitat protection for the undesignated low road density areas was first considered. Currently there is no broad scale level of habitat protection. However, as discussed above, conservation strategies for these species should be correlated with the value of these

undesignated low road density areas for these species. Field units should review the opportunity to increase the representation of these areas through the Stepdown Process (i.e. Subbasin Assessment and Watershed Analysis process for LRMP adjustments) for use in the development of aquatic conservation and restoration strategies. Road construction in undesignated low road density areas should be allowed only after completion of the mid/fine scale analysis for the these areas.

Mid/Fine Scale Recommendations

The mid/fine scale analysis of low road density areas is necessary to fulfill the LRMP BO commitments that can only be accomplished at this finer scale, using higher resolution, local information (see summary of analysis approach, Table 1). This analysis will provide for the consideration of individual low road density areas, as opposed to the broad pattern of low road density areas at the subbasin scale considered in this analysis. It is not expected that this analysis will be a new job for the field units, conducted as a stand alone effort. The recommendation is that this analysis needs to be incorporated into the ongoing and future assessments and analyses being implemented by the specific unit. There is a link between this analysis and a variety of other assessment and planning efforts, including; subbasin assessment, subbasin review, ecosystem assessment, roads analysis, unroaded area analysis, LRMP analysis and planning, and broad scale NEPA analysis. Each field unit is involved in a specific mix of these efforts, based on the local priorities. Instead of creating the expectation that the mid/fine scale analysis be identified as a separate new job, competing for priority with the rest of these efforts, the team recommends that the mid/fine scale analysis of low road density areas be incorporated into these other analyses, as appropriate, by the local unit. The ramifications of this approach are that there will not be a specific schedule or set of products from this analysis consistent across the units. It will be a local interagency responsibility to determine when the requirements of the mid/fine scale analysis have been fulfilled.

The coarse scale analysis of low road density areas completed by the RDAT provides two important components for use by the field units in the mid/fine scale analysis. This analysis has identified the low road density areas using a consistent protocol, which can be provided to the local units efficiently. Additionally, this analysis has established the broad scale context for these areas, necessary for setting the stage for the finer scale analyses.

It will be necessary to assemble a package of guidance, information, and tools to be provided to the local units, to allow for effective completion of the mid/fine scale analysis. This package should utilize methods such as posters and slide presentations. This coarse analysis has built the foundation on which these products can be quickly assembled. The components which should be provided to the local units include: direction and guidance on implementation of the mid/fine scale analysis of low road density areas; unit or basin specific views of the identified low road density areas and associated information; efficient tools for use by the units to incorporate local information about these areas; the broad scale context developed through this analysis; and examples of completed mid/fine scale analyses that illustrate the potential approach and outcomes of this effort.

The package of direction, information, and tools suggested above could be assembled by the RDAT, for distribution to the units. However, it is recommended that the Subbasin Assessment Team chartered by the IIT be asked to complete this task. It makes sense that this task team take the lead on coordination with the local units on assessment efforts. Additionally, there may be the opportunity to combine this job with other assessment tasks being completed by this team, increasing efficiency. It would be necessary for some portion of the RDAT to work with the Subbasin Assessment Team to hand-off this analysis and information products.

It will be necessary to clearly describe the expectations of the mid/fine scale analysis of low road density areas to the local units. The team recommends that these expectations include: validation of the coarse scale analysis results, specifically the accuracy of the broad scale information used to complete the analysis; incorporation of local information on the low road density areas, including information on species status and local management designations; and the assessment of the individual low road density areas including the development of recommendations regarding future management options as described in the LRMP BO's. It is expected that these tasks can be efficiently incorporated and documented in the specific assessments and analyses the local unit implements.

The mid/fine scale analysis of low road density areas described here is recommended as the best way to fulfill the commitments of the LRMP BO, while acknowledging the limits of broad scale data, and respecting the roles and insights of local units. The recommended approach of incorporating this job into the unit's assessment and analysis priorities recognizes the reality of current workloads. The conservation of listed fish species is an important responsibility of these agencies. The low road density areas are recognized as playing an important role in this effort. The team recommends this mid/fine scale approach to analysis of low road density areas as a meaningful way to develop the common understanding of these areas, necessary to the development of a common vision of the future management options in these areas. This analysis should be completed prior to road construction in these areas.

Recommendations for Analysis Update

Following significant updates in the information used to complete this analysis the IIT should commission the RDAT to update this analysis. Significant updates might include the development of higher resolution electronic road layers, completion of priority watershed designations, or updates in species status calls. If the results of this updated analysis are significantly different, the RDAT should present these changes to the IIT for consideration of appropriate response.

Recommendations for Distribution of Coarse Scale Analysis

Following IIT acceptance of this analysis, this report should be collated and distributed to the field units within the analysis area. The RDAT would be available to produce this distribution report at the request of the IIT.

Recommendations Regarding Broad Scale Conservation Strategies

In partial fulfillment in the 1998 bull trout and steelhead BOs, the RDAT identified subbasins where current broadscale information and road density data identifies areas important to conservation of the ESA listed Chinook salmon, steelhead, and bull trout. To fulfill this BO requirement, the RDAT recommends the field units refine this information through Subbasin Assessment and Watershed Analysis and apply it in LRMP adjustments and in the development of aquatic conservation and restoration strategies. The low road density areas have been identified in the Snake and Upper Columbia River Basins. The undesignated low road density areas represent important areas for the conservation of listed fish species. These areas should be considered an important component in the development of any conservation strategy for the listed fish species in this area.

Acknowledgments

The team acknowledges the contribution of many people in the design, implementation, and review of this analysis. However, it was the efforts of Cary Lorimer, information analyst that made this analysis possible. The quality and efficiency of his work, not to mention his patience with the team, were the foundation of everything that was accomplished in this analysis.

Appendices

Appendix A – References

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Appendix B - Road Density Analysis Team

Dan Duffield – Team Leader	FS Intermountain Regional Office – Ogden
Kerry Overton	Rocky Mountain Research Station – Boise
Ken Troyer	National Marine Fisheries Service – Boise
Rick Edwards	National Marine Fisheries Service – Boise
Ron Rhew	US Fish & Wildlife Service – Portland
Lew Brown	Bureau of Land Management – Coeur D'Alene
Tom Wawro	Bureau of Land Management – Portland
Rick Stowell	FS Northern Regional Office – Missoula
Dave Heller	FS Pacific Northwest Regional Office – Portland
Scott Russell	FS Nez Perce National Forest – Grangeville

Appendix C – LRMP Biological Opinion Requirements

From the Biological Opinion on Land and Resource Management Plans for National Forests and Bureau of Land Management Resource Areas in the Upper Columbia River Basin and Snake River Basin Evolutionarily Significant Units, March 19, 1998, page 41:

The implementation team described in the accountability mechanism described above, will select a team of agency technical experts and research scientists to guide this assessment [of unroaded and low road density areas]. The assessment shall include the items listed below.

a. Descriptions, locations, and maps of unroaded and low density roaded areas and existing information on the relative habitat value of those areas for anadromous fish. Unroaded and low density roaded areas should include designated wilderness, Rare II areas, or other unroaded areas identified in LRMPs, Outstanding Resource Waters, and information contained within the scientific assessment for ICBEMP.

b. Existing management direction will be summarized for each area identified in item a., above.

c. The team of scientists and agency experts will review this information and make recommendations to senior level managers. Those recommendations and options on future management of these areas hall, at a minimum, address the following in relation to recovery and conservation of anadromous fish:

    1) Need for additional habitat protection;
    2) Relative risk (near and long term) of developmental activities;
    3) Priorities for sub-basin assessments or watershed analyses;
    4) Connectivity between these areas; and
    5) Restoration priorities.

    The above actions shall be completed prior to March 1, 1999, to enable use of resulting information in planning and evaluating 1999 field season projects. Proposed projects requiring road construction in any of these unroaded or low density roaded areas, will be considered to have insufficient analysis for he completion of Section 7 consultation and will not be forwarded to Level 1 teams until this assessment has been completed.

d. If the team in item c., above, recommends that additional habitat protection is required beyond what is existing in current plans for any BLM or National Forest area, a mutually agreed upon strategy will be developed by September 1, 1999 to provide that protection.

Appendix D – Protocol for the Identification of 1000 Acre Areas With No Roads

The objective of this procedure is to calculate all areas greater than 1000 acres within a watershed, that have no roads. The report refers to these areas as low road density areas, while in this protocol these areas are termed unroaded. Refer to the discussion on page 10 for the rationale for this difference. This analysis should not be confused with any Region's Roadless Area Inventory Protocol and the resulting unroaded areas should not be confused with Inventoried Roadless Areas. For clarity, we are calling the identified areas "unroaded" rather than "roadless".

Assumptions:

1. The unroaded area boundaries will not be within 50 feet (15.24 m) of the center line of a road.

2. When roads are within 1/2 mile (804.67 m) of each other (peninsula or neck), the area between the roads will not be considered part of the unroaded areas.

3. The area of each unroaded area will be greater than 1000 acres, within a 5th code HUC watershed.

Procedures:

1. Buffer Roads

   Buffer roads by 1/4 mile (403 m). This is 1/2 of the minimum dimension allowed for peninsulas or necks:

   ```
   buffer road road_buff # # 403 10 line round full
   ```

   This created cover road_buff with an item called inside. The value for inside is 100 for roaded polygons and 1 for unroaded polygons.

2. Eliminate Small Unroaded Polygons

   We are looking for polygons 1000 acres or greater, so we can eliminate small unroaded polygons at this point. The next step will be to expand the unroaded polygons back towards the road the road that was buffered by 1/4 mile, so we test for elimination by adding the area to the perimeter * (1/4 mile - 50 feet) and then eliminating the polygons for which that is less than 800 acres (3237440 sq meters). To eliminate small unroaded polygons:

   ```
   eliminate road_buff road_buff2
           reselect ( area + ( perimeter * 387.76 ) < 3237440 ) and inside = 1
   ```

3. Put boundary around forest

   Because the unroaded polygons began as "holes" between the polygons resulting from the road buffers, unroaded polygons on the edge of the forest are part of the universal polygon. The next step will be to buffer the unroaded polygons back towards the roads that form their edge and to do this, the unroaded polygons must have boundaries. Create a forest boundary cover (called nez here) and union the road_buff2 cover with the forest boundary:

   union road_buff2 nez road_buff_nez 1 join

   Next, simplify this cover by dissolving adjacent polygons with the same attribute for inside:

   In tables, change the value of inside for the universe polygon to 0
   dissolve road_buff_nez roaded_nez inside poly

4. Buffer the unroaded polygons

   Because the initial step involved buffering all the roads by 1/4 mile, the boundaries of the unroaded areas are 1/4 mile from the road. In this step, the unroaded polygons are buffered by 1/4 mile, less 50 feet to place their boundaries close to the roads which should form their boundaries.

   additem roaded_nez.pat roaded_nez.pat buff_distance 3 3 i
   In tables:
   select roaded_nez.pat
   resel inside = 1
   calculate buff_distance = 387
   buffer roaded_nez unroaded buff_distance # # 1 poly

5. Clip to forest boundary:

   clip unroaded nez unroaded_nez poly 1
   and calculate acres of these original unroaded polygons:
   additem unroaded_nez.pat unroaded_nez.pat unroaded_acres 10 10 i
   in ae: select inside = 100
   calc inside = area / 4046.8
   This gives us the ability to show which polygons are in an unroaded polygon of a given size.

6. Create a region subclass of these unroaded polygons:

   regionquery unroaded_nez unroaded_nez unroaded

7. Union the unroaded_nez with the nfbdy cover, and the cumulative effects watersheds:

union unroaded_nez nfbdy_169k unroaded_nez1 1 join
union unroaded_nez1 cew unroaded_nez2 1 join

8. Create region subclasses for groups of polygons of interest:

   a. Drop unneeded items
   Dropped all items except area, perimeter, unroaded_nez2#, unroaded_nez2-id, and inside.

   inside: 100, unroaded
   1, roaded
   unroaded_aces: the acres of the original unroaded polygon in which the current polygon exists. This allows user to tell if a small polygon is part of a larger unroaded polygon.
   forplan_ce: The cumulative effects watershed to which the polygon belongs

   b. Create region subclasses:

   unroaded
   all unroaded polygons within the outer boundary of the Nez Perce Forest (including Elk City Township). Created above in step 6.

   unrd_wld
   all unroaded polygons within outer boundary of Nez Perce Forest in a wilderness area

   regionquery unroaded_nez3 unroaded_nez3 unrd_wld # contiguous inside, unroaded_acres, wilderness.unit_id
   >: res inside = 100 and wilderness.unit_id <> '' and forest.forest <> ''

   unrd_nwld_tmp
   a temporary subclass which contains all the unroaded areas but shows which are in wilderness

   regionquery unroaded_nez2 unroaded_nez2 unrd_nwld_tmp # contiguous inside unroaded_acres unrd_wld.unrd_wld#
   >: res unroaded.unroaded# > 0

   unrd_nwld
   all unroaded polygons within outer boundary of Nez Perce Forest (including Elk City Township) but not in a wilderness area

   regionquery unroaded_nez2 unroaded_nez2 unrd_nwld # contiguous inside unroaded_acres

res unrd_nwld_tmp.unrd_wld# = 0 and inside = 100

dropfeatures unroaded_nez2 region.unrd_nwld_tmp

unrd_nrii_t

a temporary subclass which contains all the unroaded areas but shows which are in Rare II areas

regionquery unroaded_nez2 unroaded_nez2 unrd_nrii_t # contiguous unroaded_acres rare_ii.rare_ii# wilderness.wilderness#
>: res inside = 100 and forest.forest <> ''

unrd_nrareii

all unroaded polygons within outer boundary of Nez Perce Forest (including Elk City Township) but not in a wilderness area or a RARE II area

regionquery unroaded_nez2 unroaded_nez2 unrd_nrareii # contiguous unroaded_acres

res unrd_nrii_t.wilderness# = 0 and unrd_nrii_t.rare_ii# = 0 and inside = 100

dropfeatures unroaded_nez2 region.unrd_nrii_t

unrd_nwsr_t

a temporary subclasswhich contains all the unroaded areas but shows which are in Wild and Scenic River Corridors, Rare II areas, and Wilderness areas

regionquery unroaded_nez2 unroaded_nez2 unrd_nwsr_t # contiguous unroaded_acres wsr.wsr# rare_ii.rare_ii# wilderness.wilderness#

res inside = 100 and forest.forest <> ''

unrd_nwsr

all unroaded polygons within outer boundary of Nez Perce Forest (including Eld City Township) but not in a wilderness area, RARE II area, or Wild and Scenic River Corridor.

regionquery unroaded_nez2 unroaded_nez2 unrd_nwsr # contiguous unroaded_acres

res unrd_nwsr_t.wilderness# = 0 and unrd_nwsr_t.rare_ii# = 0 and unrd_nwsr_t.wsr# = 0 and inside = 100

dropfeatures unroaded_nez2 region.unrd_nwsr_t

An item called meets_protocol was added and polygons > 1000 acres adjacent to wilderness, unroaded, or wsr were coded with a Y.

unrd_wsd

all unroaded polygons within outer boundary of Nez Perce Forest (including Elk City Township), subdivided by cumulative effects watershed boundaries

regionquery unroaded_nez2 unroaded_nez2 unrd_wsd # contiguous forplan_ce unroaded_acres
res inside = 100 and forest <> "

wild_nez

wilderness within the Nez Perce

regionquery unroaded_nez2 unroaded_nez2 wild_nez # contiguous wilderness.unit_id
reselect nez.area > 0 and wilderness.area > 0

8. Rename cover to unroaded_nez